CLAIMS

1. An implant device for implantation into ischemic tissue comprising:

an implant having a first configuration with a first profile and a second configuration having a second profile that is greater than the first profile whereby surrounding tissue into which the implant is placed in stress and is irritated sufficiently to cause an injury response including thrombosis formation that initiates angiogenesis.

2. An implant as defined in claim 1 further comprising a spring that is resiliently expandable from the first configuration to the second configuration.

3. An implant device as defined in claim 1 wherein the implant defines a hollow interior.

4. An implant device as defined in claim 1 wherein the implant is flexible after assuming the second configuration.

5. An implant device as defined in claim 1 further comprising an angiogenic substance for promoting angiogenesis is associated with the implant.

6. An implant device as defined in claim 5 wherein the angiogenic substance is joined to the device by a coating.

7. A device as defined in claim 5 wherein the angiogenic substance becomes associated with the device after the device is delivered into the tissue.

8. An implant device as defined in claim 7 wherein the body of the device defines a hollow interior and the angiogenic substance is inserted into the hollow interior after the device is implanted.

9. An implant device as defined in claim 3 further comprising an angiogenic substance loaded into the hollow interior prior to implantation of the device.

10. An implant device as defined in claim 9 further comprising at least one opening in the body of a size to permit the angiogenic substance to transfer from the interior to the outside of the device.

11. An implant device as defined in claim 5 wherein the angiogenic substance becomes associated with the implant after it is implanted.

12. An implant device as defined in claim 2 wherein the implant is a cylinder.

13. An implant device as defined in claim 2 wherein the implant is bifurcated.

14. An implant device as defined in claim 2 wherein a first portion of the body remains static during and after delivery and a second portion of the body moves to a different position relative to the first portion after implantation to comprise a second configuration of the device.

15. An implant device as defined in claim 14 wherein the implant comprises an elastic material and the motivational energy to cause the implant to move from the first to the second configuration is the inherent resiliency of the material.

16. An implant device as defined in claim 15 wherein the first portion is a cylinder and the second portion is defined by at least one cylinder, smaller than the cylinder of the first portion, extending from and attached to the first portion at one end, and a second end being free.

17. An implant device as defined in claim 16 wherein the free end of the second portion is configured to pierce the tissue.

18. An implant device as defined on claim 15 wherein the first portion of the body is defined by an axial member and the second portion being defined by a plurality of C-shaped rings joined to the axial member and lying within a plane that is substantially perpendicular to the axial member.

19. An implant device as defined in claim 2 wherein the body is comprised of a tube rolled from a flat sheet.

20. A method of promoting angiogenesis in ischemic tissue comprising the steps of:

accessing the ischemic tissue,

inserting an implant into the tissue,

orienting the implant in the tissue to place the tissue in stress.

21. A method of promoting angiogenesis in ischemic tissue as defined in claim 20 wherein:

the step of orienting the implant to place the tissue in stress further comprises expanding the implant from a low profile first configuration to a large profile second configuration.

22. A method of promoting angiogenesis as defined in claim 22 comprising the further step of associating a angiogenic substance with the device after it is implanted.

24. A method of promoting angiogenesis as defined in claim 22 wherein the implant comprises a body having an interior containing an angiogenic substance to promote angiogenesis.

25. A method of promoting angiogenesis in ischemic tissue comprising: irritating the tissue sufficiently to cause an injury response in the tissue that includes thrombosis and initiates angiogenesis.

26. A method of promoting angiogenesis as defined in claim 25 wherein the tissue irritation is caused by the presence of a implant in the tissue.

27. A method as defined in claim 26 wherein the implants are implanted entirely and only within the myocardium.

28. A method of promoting angiogenesis as defined in claim 26 wherein the implant is expanded from a first configuration to a second configuration of increased profile to cause tissue injury.

29. A method of promoting angiogenesis as defined in claim 26 wherein the tissue is myocardial tissue.

30. A delivery device for placing an implant in the myocardium of a patient comprising:

a steerable delivery catheter having at least one lumen and a defined length;

an elongate shaft slidable through the lumen the delivery catheter having a proximal end, a sharpened distal end capable of piercing tissue and a length greater than the length of the delivery catheter;

means at the distal end of the shaft for releasably retaining the implant in a low profile first configuration and configured to release the implant to a large profile second configuration.

31. A method of percutaneously delivering an implant to myocardial tissue comprising :

providing an implant having a low profile first configuration and a large profile second configuration;

providing a delivery catheter having proximal and distal ends and at least one lumen defined between the ends;

providing an elongate shaft slidable through the lumen of the delivery catheter, having a sharp distal end and means for releasably retaining the implant in its first configuration at the distal end of the shaft;

inserting the delivery catheter in the patient and navigating it through the patient's vessels to the left ventricle and positioning the distal end adjacent myocardial tissue;

advancing the shaft, with the implant retained on the distal end, through the lumen of the delivery catheter so that so that the sharp distal end of the shaft and implant protrude from the distal end of the catheter and penetrate the myocardium;

positioning the implant to the desired depth in the myocardium;

releasing the implant from the distal end of the shaft so that it expands to its second configuration in the myocardium;

withdrawing the shaft and delivery catheter from the patient.

32. An implant as defined in claim 1 wherein the implant comprises a brush comprising a core and a plurality of resilient bristles extending from the at a first angle, acute to the core, in its low profile first configuration and extending from the core at angle greater than the first angle in its large profile second configuration.

33. An implant as defined in claim 32 wherein the core defines an interior.

34. An implant as defined in claim 32 wherein the bristles are tubular, each defining an interior.

35. An implant as defined in claim 32 wherein the bristles are configured to carry an angiogenic substance.